SATHYABAMA UNIVERSITY
(Established under section 3 of UGC Act, 1956)

Course & Branch: B.Arch
Title of the paper: Mathematics - II
Semester: II   Max. Marks: 80
Sub.Code: 621201(2006/2007)   Time: 3 Hours
Date: 10-12-2008   Session: FN

PART – A   (8 x 4 = 32)
Answer ALL the Questions

1.   Define Arithmetic mean and state any two properties.

2.   The first two moments of a distribution about $x = 4$ are 1 and 4 respectively. Show that the mean and variance are 5 and 3 respectively.

3.   Define Type I, Type II errors, null and alternative hypothesis.

4.   Explain in detail the procedure involved in testing of hypothesis.

5.   The two lines of regression are $x + 2y – 5 = 0$ and $2x + 3y = 8$. find the mean values of x and y.

6.   Fit a straight line to the data given below.

x	0	1	2	3	4
y	43	38	22	9	1

7.   A box contains 3 white, 4 red and 5 black balls. Two balls are drawn at random. Find the probability that
     (a) both of them are of the same colour
     (b) they are of different colours.

8. It is known that the probability of an item produced by a certain machine will be defective is 0.05. IF the produced items are sent to the market in packets of 20. Find the number of packets containing atleast, exactly and atmost 2 defectives in a consignment of 1000 packets.

<div align="center">PART – B   (4 x 12 = 48)

Answer ALL the Questions</div>

9. Obtain mean, median and mode for the following data:

Values	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Frequency	2	28	125	270	303	197	65	10

<div align="center">(or)</div>

10. Obtain the Karl Pearson coefficient of Skewness for the following data:

Values	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	6	8	17	21	15	11	2

11. Two samples of sizes 9 and 8 gave the sum of squares of deviations form their respective means equal to 160 and 91 respectively. Could both samples be form populations with the same variance?

<div align="center">(or)</div>

12. A survey of 320 families with 5 children each revealed the following data:

No. of boys	0	1	2	3	4	5
No. of girls	5	4	3	2	1	0
No. of families	12	40	88	110	56	14

Is this result consistent with the hypothesis that male and female births are equally probable?

13. Fit a parabola to the following data using the method of least squares.

x	1	2	3	4	5
y	2	3	5	8	10

(or)

14. Obtain the rank correlation coefficient for the following data:

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	7

15. In a bolt factory machines A, B and C manufacturer respectively 25%, 35% and 40% of the total. Of their output 5%, 4% and 2% respectively are defective bolts. A bolt is drawn at random form the product and is found to be defective. What are the probabilities that it was manufactured by machines

    (i) A   (ii) B and   (iii) C.

(or)

16. In a test on 2000 electric bulbs, it was found that bulbs of a particular make were normally distributed with an average life of 2040 hours and standard deviation of 60 hours. Estimate the number of bulbs likely to burn for

(a) more than 2150 hours
(b) less than 1950 hours
(c) more than 1920 hours but less than 2160 hours?